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AMSAT NEWS SERVICE
ANS-192

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to: ans-editor(a)amsat.org

You can sign up for free e-mail delivery of the AMSAT News Service Bulletins via the ANS List; to join this list see: https://mailman.amsat.org/postorius/lists/ans.amsat.org/

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AMSAT News Service Bulletin 192.01
To: All RADIO AMATEURS
From: Radio Amateur Satellite Corporation
 712 H Street NE Suite 1653
 Washington, DC 20002

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AMSAT CubeSatSim First Official Release – v1.0

I am very pleased to announce the first software release of the CubeSatSim software v1.0! Along with the first hardware release v1.0 last month, this is an important milestone for this AMSAT educational project.

All the CubeSatSim software and hardware is fully open source. The v1.0 release info is available on GitHub here: https://github.com/alanbjohnston/CubeSatSim/releases/tag/v1.0 and the v1.0 hardware info including gerber files is available here: https://github.com/alanbjohnston/CubeSatSim/tree/v1.0/hardware/v1.0

Thanks to Bruce Paige, KK5DO, we have CubeSatSim blank PCB sets and CubeSatSim Raspberry Pi SD cards available on the AMSAT Store. For the moment, they are only available to ship to US addresses. In a post-COVID future, we hope to offer worldwide shipping.

The CubeSatSim Raspberry Pi SD Card is a 16 GB micro SD card with Raspberry Pi OS Lite and all the CubeSatSim software installed and configured on it. It is available at the AMSAT Store for $20 https://www.amsat.org/product/amsat-cubesatsim-raspberry-pi-sd-card/ You can also download the image and flash it to your own SD card using these instructions https://github.com/alanbjohnston/CubeSatSim/wiki/2.-Software-Install Here is the readme file for the CubeSatSim software https://cubesatsim.org/download/cubesatsim-readme.pdf

With the 3 board sets of blank PCBs, you can order the parts and solder your own CubeSatSim. They are available at the AMSAT Store for $35 https://www.amsat.org/product/amsat-cubesatsim-pcb/

I want to take this opportunity to thank the team that has been working on the CubeSatSim Project including Pat Kilory, N8PK, Jim McLaughlin, KI6ZUM, and David White, WD6DRI. In addition, Chris Thompson, G0KLA/AC2CZ has been instrumental in helping me get the FSK/BPSK transmit code working and has added support for the CubeSatSim to FoxTelem. Yesterday's release of FoxTelem v1.11 has full CubeSatSim support.

And of course, thank you to the AMSAT Board of Directors and the AMSAT membership who have supported this project for many years.

P.S. AMSAT has CubeSatSim Loaners available to ship to your event or presentation or STEM outreach activity - just contact me if you have an upcoming event.

[ANS thanks Alan Johnston, KU2Y, AMSAT Vice President - Educational Relations, for the above information]

AMSAT FoxTelem Version 1.11 Released

I am releasing version 1.11 of FoxTelem. This primarily supports new features needed for GOLF-TEE development and the CubeSatSim. If you are using FoxTelem in the lab or classroom then this release should be installed. It also fixes several bugs that will help with live decoding of AO-95. It is not a mandatory upgrade but it is recommended.

Specifically it addresses the following:
* Fixes a bug where Costas decoding can stop if audio is being monitored
* Supports all the latest features needed for the CubeSatSim
* Better warnings for tracking and Find Signal errors
* Supports all the latest GOLF-TEE layouts
* Fixes a bug where strong signals may not be tracked correctly
* Supports math expressions in telemetry conversions
* Better handles USB device errors

You can download FoxTelem here:
http://amsat.us/FoxTelem/windows/FoxTelem_1.11g_windows.zip
http://amsat.us/FoxTelem/linux/FoxTelem_1.11g_linux.tar.gz

http://amsat.us/FoxTelem/mac/FoxTelem_1.11g_mac.tar.gz

Feel free to reach out to me with questions or comments.

[ANS thanks Chris Thompson, G0KLA/AC2CZ, AMSAT FoxTelem Developer, for the above information]

AMSAT Pacsat Ground Station Version 0.43 Released

I'm releasing an update to the Pacsat Ground Station. This version
- Parses the MO-112 FailSafe beacons and saves them for analysis.
- Fixes a bug where FalconSat-3 telemetry data could not be downloaded from the server
- Defaults FalconSat-3 to not check Pacsat File Header checksums. This was annoying for partially downloaded files.

You can download it here:
https://www.g0kla.com/pacsat/index.php

[ANS thanks Chris Thompson, G0KLA/AC2CZ, AMSAT Pacsat Ground Station Developer, for the above information]

FalconSat-3 Update

I had sufficient WiFi to check out FalconSat-3 thisvaround 1200 UTC 8 July 2021. Thankfully, only the TX had gone off and a reload right now isn't necessary.vIf I can make the time, I'll look over the telemetry logs and see if we had a low voltage trip or something, but not sure.

Users---until further notice, please limit the size of your uploaded files to around 10k or less. Just before the bird went silent, numerous large files were being uploaded and downloaded. I cannot say for sure if this is related to the recent issue, but let's call it a hunch.

In the meantime, FalconSat-3 is again open for BBS and digipeater use - please limit file upload size to 10K or less.

[ANS thanks Mark Hammond, N8MH, AMSAT Director and Command Station, for the above information]

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The submission form is located at https://www.amsat.org/field-day/

[ANS thanks Bruce Paige, KK5DO, AMSAT Director of Contests and Awards, for the above information]

MIR-SAT1 Gold Award Winners

On behalf of the Mauritius Amateur Radio Society (MARS) I am pleased to inform you that the MIR-SAT1 Gold Award winners are:

WO3T
SatNOGS# 2134 / WesternMA Yagi
VU2LBW
PA5OXW
JA6PL
KB6LTY
1062-CCERES Ground Station
3B8FA
SP7THR-UHF / 2012
EU1XX
JH4DHX/3
PY2SDR
BX1AD
MAUFOX
F6HDW
W7KKE
KC9ELU
LU1KCQ
VK2PET
YC5ABK

Congratulations to them all.

Now there are 30 Silver Awards at stake, to remind the rules: one must have uploaded at least one full valid MO-112 frame to Satnogs and apply for the award by submitting their participation to MARS (link: https://docs.google.com/forms/d/e/1FAIpQLSdCAAKTMtTmARDwrjIE_Coai1WR9b2zUFjBPFbOghMe63gqdg/viewform).

Good luck to all for the Silver Award.

Thanking all for sending to Satnogs the TLM’s which is really appreciated and really useful to us.

[ANS thanks Jean-Marc Momple, 3B8DU, MIR-SAT1 (MO-112) Team, for the above information]

Long Live PCSAT (NO-44) (and PCSAT-11)

Some (current) APRS Amateur Satellite history:

CONSTRUCTION: For what it is worth, After 20 years, both PCSAT side A and B transponders (digipeaters) remain semi-operational as the longest running student project satellites in space. Further they were built desk-top style using simple off-the-shelf Kantronics KPC-9612 TNC's and Hamtroncs kit TX/RX boards. All parts are COTS and chips are in sockets. Batteries are AA NiCd's. There are no CPU's on board. All command/control/telemetry is just what is inherent in the TNC's. Only thing we did was replace all electrolytic caps with tantalums. Having no clean room, we just used kem wipes and alcohol to wipe off all the fingerprints and dust before bagging

for delivery.

NOTE: No one should be so cavalier if their mission is REAL and costing great amounts of expectations and money. Back then it was just a free ride with no expectations other than student involvement.

SAFE MODE (NOT): The only thing wrong was stupid thinking on the power budget. As our first satellite, we put on dual A/B systems AND additional 9600 baud DUAL UHF backup link receivers so that we had QUAD backup command RX capabilities in case of failures. The problem was we decided that all systems must come up on power-up in order to have access to all the redundant backup reset and command capabilities if needed and (DUH!), if all was OK, we would turn off the unnecessary backup-UHF receivers and un-crossconnect the transmitters.

TOO-COMPLEX LOGON: That is what kills it (on every orbit). If the reason it reset is because of low battery, then the last thing you want is for EVERYTHING to be ON when you are coming into the sun and trying to charge back up. There is not yet enough power to get the command in to command off the unnecessary systems! Further, the commands required a full two-way AX.25 connection requiring 5 packets to exchange the password challenge and password response. All of which fully loaded the cross-connected XMTRs while trying to recover power.

NO CPU or OPERATING SYSTEM: PCSAT had no programmable CPU. Just two-dual-port TNCs and 2 VHF XMTrs and 2 VHF RCVRS, and 2 UHF 9600 baud RCVRS. There was nothing in which to put SMART-safe-mode power-up thinking. Hence the fatal flaw to just power up everything and command later...
 duh...

WITH LUCK: But luckily, the orbit occasionally has short eclipses and longer sun side (about 1 hour) which gives it enough time to sometimes have enough power to do a few user digipeats. Though after only a few, that usually kills the battery for the rest of the orbit. We long since gave up trying to go through the entire secret logon process to try to turn off the extra UHF receivers, only to have it last another' 10 minutes or so until the next eclipse and so that is why it just does its thing and sometimes people are successful, or not.

MISSION: Side A of PCSAT (AKA W3ADO-1) remains operational on 145.825 digipeating when power permits. Same for side B which has a digipeater with a 144.39 MHz downlink for use over North America which at the time was thought would be useful for communicating *TO* normal 144.39 travelers who may be traveling outside of range of the terrestrial network for a while.

TODAY (June 8, 2021), one of our sysops tested the side "B" and confirmed it remains operational. That is why you might occasionally see PCSAT-11 in the APRS logs. Although within the rules at the time of launch, in the last decade, the IARU has officially made notice that operation of satellite downlinks in the old 144.30-144.40 range are no longer authorized. Besides, we never came up with a good use of the side B anyway. (Broadcast an APRS message to all North American mobiles, or special traffic to a specific mobile).

Of course, we learned those lessons and had 6 successful followon APRS satellites with only the last two (PSAT and PSAT2) had programmable CPUs (BASIC Stamps). See http://aprs.org/sats.html

[ANS thanks Bob Bruninga, WB4APR, for the above information]

Changes to AMSAT TLE Distribution for July 8, 2021

The following satellite has been added to this week's AMSAT TLE

Distribution:

TUBIN - NORAD Cat ID 48900 (Thanks to Nico Janssen, PA0DLO for the identification.)

The following satellite has been deleted from this week's AMSAT TLE Distribution:

STAR-Me Mother - NORAD Cat ID 43640 (Decayed June 26, 2021)

Drew Glasbrenner, KO4MA (OSCAR Number Administrator) announced July 3, 2021 in AMSAT News Service Bulletin ANS-185 that MIR-SAT1 has been designated MIRSAT-OSCAR 112 or MO-112.

Thus, MIRSAT1 (NORAD Cat ID 48868) is now shown as MO-112 in this week's TLE distribution.

[ANS thanks Ray Hoad, WA5QGD, AMSAT Orbital Elements Manager, for the above information]

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for the above information]

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AMSAT Board of Directors will meet prior to the Symposium. Further details, including final dates, hotel reservation details, tours, and other events will be shared in the coming months.

Want to see AMSAT in action or learn more about amateur radio in space?

AMSAT Ambassadors provide presentations, demonstrate communicating through amateur satellites, and host information tables at club meetings, hamfests, conventions, maker faires, and other events.

AMSAT Ambassador and ARRL registered instructor Clint Bradford, K6LCS, is certainly keeping busy! He reports a long list of completed online presentations. Think a 90-minute lively, informative, and fun “How to Work the Easy Satellites” Zoom presentation would be appropriate for your convention or club? Always includes are overviews of the ARRL, AMSAT, and ARISS … and pre-presentation questions are solicited and welcome. Send Clint an email or call!

Clint Bradford K6LCS
http://www.work-sat.com
909-999-SATS (7287)

Tom Schuessler, N5HYP, has put out a call for assistance for an upcoming event:

Hi all,

In person events are back! The Frontiers of Flight Museum in Dallas, TX is this year returning to their in-person “Moon Day” space themed STEM event on July 24th. I have signed up for AMSAT and Amateur Radio in Space as an exhibito, as we have in past years. I will have the AMAT Cubesat Simulator and the Fox Engineering model to show off to the kids attending and will use iPad apps and SatPC32 to show orbits/footprints and such. There even are a couple AO-91 passes during the event.

I have already a few volunteers for the event but if you live in the DFW area and enjoy communicating with young people, I would love to hear from you.

Event details:

Location: Frontiers of Flight Museum, Love Field, Dallas, TX

Time: Setup 7:30-9:45AM, Event 10:00AM through 3PM, teardown to follow.

Drop me an email, and I will give you more details.

73

Tom Schuessler, N5HYP at amsat.org

[ANS thanks the AMSAT Symposium Committee, Tom Schuessler, N5HYP, and Paul Overn, KE0PBR, AMSAT Events Page Manager, for the above information]

Satellite Shorts From All Over

+ Congratulations to Mike McCoy, KC9ELU, on completing the AMSAT GridMaster Award for working and confirming QSOs with all 488 grid squares in the continental United States. Mike is the 32nd recipient of AMSAT's GridMaster Award. More details about the GridMaster Award can be found at https://www.amsat.org/gridmaster/ [Thanks to Bruce Paige, KK5DO, AMSAT Director of Contests and Awards]

+ Several new products are available on the AMSAT Zazzle store, including a set of coasters, a watch, a t-shirt featuring the AMSAT round logo, and more. Check out the new items! 25% of the purchase price goes towards Keeping Amateur Radio in Space. https://www.zazzle.com/amsat_gear

+ All issues of The AMSAT Journal dating back to 2014 are now available to AMSAT members on AMSAT's new membership portal. The 1969-2013 archive will be added at a later date. All editions of AMSAT's Symposium Proceedings are also available for members. If you're a current AMSAT member, get logged on today. If you are not yet a member, consider joining today at https://launch.amsat.org/

+ The 2020 edition of AMSAT's Getting Started with Amateur Satellites is available on the AMSAT store. A perennial favorite, Getting Started is updated every year with the latest amateur satellite information, and is the premier primer of satellite operation. The book is presented in DRM-free PDF format, in full color, and covers all aspects of making your first contacts on a ham radio satellite. The digital download is available for $15 at https://tinyurl.com/2020GettingStarted. The print edition is $30 plus shipping and is available at https://tinyurl.com/GS2020Print

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. President's Club donations may be made at https://www.amsat.org/join-the-amsat-presidents-club/

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status.

Join AMSAT today at https://launch.amsat.org/

73 and remember to help Keep Amateur Radio in Space,

This week's ANS Editor,

Paul Stoetzer, N8HM
n8hm at amsat dot org